REMARKS

Examiner Interview

Applicants thank the Examiner and her supervisor for their courtesy extended to Applicants' representatives during the telephonic interview on July 9, 2010. During the interview, Applicants' representative discussed with the Examiner differences between the claims and the cited references, as detailed in the Amendment filed on March 15, 2010, and in the Response to Interview Summary and Supplemental Amendment filed on April 9, 2010.

After the interview of July 9, 2010, the Examiner telephoned Applicants' representative on July 15, 2010, and requested that Applicants file a response in reply to the Office Action mailed May 7, 2010 to more clearly present the differences between the prior art and the claims. This paper responds to both the Office Action mailed on May 7, 2010 and the Interview Summary form mailed on July 20, 2010.

Office Action

Claims 27-52 are pending and under current examination. Applicants traverse the following rejections set forth in the Office Action:

> (a) rejection of claims 27-29, 31-37, 39-46, 49, and 50 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Pub. No. 2003/0125046 A1 ("Riley") in view of U.S. Patent Application Pub. No. 2002/0101912 A1 ("Phelts");
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> (b) rejection of claims 30, 38, 47, and 51 under 35 U.S.C. § 103(a) as being unpatentable over Riley and in view of Phelts and in further view of U.S. Patent No. 6,055,477 ("McBurney");
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> (c) rejection of claim 48 under 35 U.S.C. § 103(a) as being unpatentable over Riley and in view of Phelts, and further in view of U.S. Patent No. 6,081,230 ("Hoshino"); and
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> (d) rejection of claim 52 under 35 U.S.C. § 103(a) as being unpatentable over Riley and in view of Phelts and McBurney, and further in view of Hoshino;

Regarding the 35 U.S.C. § 103(a) Rejections

Applicants respectfully request reconsideration and withdrawal of the rejections of the claims under 35 U.S.C. § 103(a) as being unpatentable over one or more of Riley, Phelts, McBurney, and Hoshino.

The cited references, whether taken alone or in any combination, do not teach or suggest the features recited in independent claim 27. Claim 27 recites "[a] method for determining at least one location coordinate of *a mobile terminal*" (emphasis added). The method recited in claim 27 includes, among other features, "subjecting ... measurements to state-based statistical filtering," wherein the state-based statistical filtering includes "providing at least one further state . . . representative of said measurement errors having non-zero mean." The method recited in claim 27 further includes "performing said state-based statistical filtering on said respective measurements, using said at least one first state and said at least one further state in said state-based statistical filtering to determine said at least one location coordinate of said mobile terminal." The cited references, whether taken alone or in any combination, do not teach or suggest the above features of claim 27.

First, in contrast to the recitation of "[a] method for determining at least one location coordinate of *a mobile terminal*" (emphasis added), Riley discloses a method for determining location parameters of *a base station using mobile stations*. *See* Riley, Title and Abstract. Therefore, Riley's method and Applicants' claimed method recited in claim 27 deal with completely opposite situations. With respect to the position of a mobile station that is used to determine the location parameters of the base station, Riley merely teaches that "the network determines the position (value and error estimate) of the mobile station independent of the position of the base station in communication with the mobile station ... [f]or example, [through]

a global satellite receiver ... using the GPS system ... [or based on] other base stations having know[n] positions." Riley at ¶ [0077] (emphases added).

Second, Riley merely mentions "a Kalman filter", *e.g.*, at ¶ [0015], stating that "[a]fter collection of multiple measurements upon the base station from one or more mobile stations from several different known locations, these measurements are used as input to a conventional position and time offset computation procedure, such as least squares, or a Kalman filter, as is commonly understood in the art of navigation" (emphases added). *See also* Riley, ¶ [0082]. Thus, Riley discloses using a Kalman filter to determine the location of the base stations, rather than the location of the mobile stations. Furthermore, Riley merely teaches a conventional Kalman filter.

As discussed in Applicants' specification, the conventional statistical filter theory that governs a conventional Kalman filter assumes that the errors have a Gaussian distribution with a zero average, or mean, value. *See* specification at, for example, p. 3, lines 5-11, and p. 6, lines 3-11. Applicants' claims, however, address a state-based statistical theory that deals with measurement errors "hav[ing] statistical distributions different from those statistical distributions (e.g. a Gaussian distribution with zero mean value) that are currently assumed in standard statistical filter theory." Specification, p. 6, lines 8-11; *see also* p. 6, lines 12-15. Specifically, Applicants' claims address "measurement error[s] [that] exhibit[] an average value (mean value) that is higher than zero and, therefore, [cannot] lead to a Gaussian distribution with zero mean value." Specification, p. 6, lines 20-23. As recited in claim 27, Applicants' state-based statistical filtering includes "at least one further state being representative of said measurement errors having non-zero mean," which, as disclosed in the specification at p. 6, lines 29-31, "is not

usually contemplated in the conventional theory of statistical filters such as the common Kalman filters."

To help the Examiner better understand the claimed invention, Applicants refer to pp. 8-9 of the specification, which discusses an exemplary state-based statistical filter according to the claimed invention, namely, an extended Kalman filter ("EKF"). *See* specification, p. 7, line 23 to p. 8, line 5. The state equations for the extended Kalman filter are shown in expression (1) at p. 8 of the specification. A state vector for the extended Kalman filter is discussed at p. 8, lines 13-20, which includes "a further state t that represents the average error of the network measurements" (p. 8, lines 16-17), where "t_k [, i.e., the value of t at the k-th step,] describes the non-zero average value of the measurement error e_k" (p. 9, lines 4-5), and that "t_k is assumed to be an unknown value to be calculated" (p. 9, line 9).

In contrast, Riley merely mentions the terminology "Kalman filter," and that the Kalman filter is used to determine the "position and time offset of a base station." Riley, ¶ [0082]. Riley, however, does not provide any details about the Kalman filter, such as the state equations, instead noting that its Kalman filter is "commonly understood in the art." *Id.* Furthermore, Riley does not teach or suggest providing a state *in the* conventional Kalman filter to represent measurement errors having non-zero mean.

The Office Action relies on Phelts to allegedly disclose "measurement errors having non-zero mean." Office Action, p. 4. Phelts, however, does not cure the deficiencies of Riley, at least because Phelts does not teach or suggest providing a state in a state-based statistical filter to represent measurement errors having non-zero mean. Even though Phelts discloses "[m]ultipath errors [having non] zero mean" (Phelts, ¶ [0012]), it is important to note that Phelts also discloses that the non-zero mean multipath errors are computed by subtracting the ideal distance

from the actual distance, as shown in Fig. 10, step 138. *See also* ¶ [0066]. Phelts also discloses that the computed non-zero mean multipath errors are subtracted from the results of the DLL, *i.e.*, from the computed pseudorange to the particular satellite in order to mitigate multipath effects. *See* ¶¶ [0066]-[0067]. Phelts, nevertheless, does not teach or suggest that the non-zero mean multipath errors are represented by a state provided in a state-based statistical filter, and are calculated by the state-based statistical filter. Therefore, Phelts' mere teaching of non-zero mean multipath errors does not cure the deficiencies of Riley, at least because both Riley and Phelts do not teach or suggest providing a state in a state-based statistical filter to represent non-zero mean measurement errors.

Thus, Riley and Phelts, whether taken alone or in combination, do not teach or suggest, among other features, "providing at least one further state in addition to said at least one first state, said at least one further state being representative of said measurement errors having non-zero mean," and "performing said state-based statistical filtering on said respective measurements, using said at least one first state and said at least one further state in said state-based statistical filtering to determine said at least one location coordinate of said mobile terminal," as recited in claim 27. Therefore, the hypothetical combination of Riley and Phelts, as proposed by the Office Action at p. 4, would not have rendered claim 27 obvious.

McBurney and Hoshino, whether taken alone or in combination, do not cure the deficiencies of Riley and Phelts, at least because McBurney and Hoshino do not teach or suggest, among other features, "providing at least one further state in addition to said at least one first state, said at least one further state being representative of said measurement errors having non-zero mean," as recited in claim 27. Furthermore, McBurney and Hoshino do not teach or suggest "performing said state-based statistical filtering on said respective measurements, using said at

least one first state and said at least one further state in said state-based statistical filtering to determine said at least one location coordinate of said mobile terminal," as recited in claim 27.

Accordingly, independent claim 27 is nonobvious over the cited references, and should be allowable. Although of different scope, independent claims 34, 35, 43, 44, and 50 recite features similar to the features discussed above and recited in claim 27. Therefore, independent claims 34, 35, 43, 44, and 50 should also be allowable over the cited references for at least the same reasons discussed above with respect to claim 27. In addition, dependent claims 28-33, 36-42, 45-49, 51, and 52 should be allowable at least by virtue of their respective dependence from base claims 27, 34, 35, 43, 44, or 50, and because they recite additional features not disclosed or suggested by the cited references. Applicants therefore respectfully request the Examiner's reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejections, and timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

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